REMARKS

35 USC §103

Claims 1-15 are rejected under 35 USC §103(a) as being unpatentable over Gallagher et al. (US 6596467) in view of Gnade (US 5804508). The Applicants respectfully disagree.

Claim 1 of the present application recites:

1. A multilayered dielectric structure which comprises:
   a) a porous dielectric layer which has a porosity of about 10% or more;
   b) an adhesion promoting dielectric layer on the porous dielectric layer which has a porosity of about 10% or less; and
   c) a substantially nonporous capping layer on the adhesion promoting dielectric layer.

In the current Office Action, the Examiner now concedes that Gallagher does not disclose a substantially nonporous capping layer; however, the Examiner then improperly combines Gallagher with Gnade to get to the result of claim 1. In order to satisfy the obviousness query, the Examiner must show some reason, suggestion, or motivation from the prior art as a whole for the person of ordinary skill to have combined or modified the references. The Patent Office has supported this view by stating: "When the incentive to combine the teachings of the references is not readily apparent, it is the duty of the examiner to explain why combination of the reference teachings is proper...Absent such reasons or incentives, the teachings of the references are not combinable." (Ex Parte Skinner, 2 USPQ2d 1788, 1790).

Specifically, Gallagher teaches that a metal layer, seed layer or barrier layer must be applied on top of the porous dielectric layer, before any additional layers are applied. Its the

essence of the Gallagher invention. Once the metal layer, seed layer or barrier layer is applied, both the porous layer and other layer are treated to remove some of the porogen from the porous dielectric layer. It is only after that point when an additional layer is applied, such as another dielectric layer. These metal layers, barrier layers and seed layers are specifically – by definition – designed to keep an additional layer from migrating into the layer below the metal layer, barrier layer or seed layer. ***In addition, the Gallagher reference specifically teaches against adding a cap layer throughout the reference and specifically in Column 11, lines 37 and 38, when Gallagher states: "Further, the elimination of an added cap layer provides a porous dielectric material layer having a rough surface."*** (emphasis added) Given that the Gallagher reference teaches against adding a cap layer, as mentioned, and that this elimination of the cap layer is the essence of the Gallagher invention, it would definitely be improper to suggest that one of ordinary skill in the art would read that reference and see a motivation to combine it with the Gnade reference. Gallagher wants a porous dielectric material layer having a rough surface and gets this desired surface by not adding a cap layer, so how does Gnade combine with Gallagher? The answer is that it cannot possibly combine logically with Gnade and therefore, the combination by the Examiner is improper.

Therefore, claim 1 is allowable as patentable over Gallagher and Gnade, since neither one alone precludes patentability of claim 1 and since it is improper to combine them to arrive at claim 1. In addition, claims 2-15 are allowable as patentable over Gallagher and Gnade by virtue of their dependency on claim 1.

Claims 16-23 are rejected under 35 USC §103(a) as being unpatentable over Gallagher et al. (US 6596467) in view of Gnade (US 5804508) and Leung et al. (US Publication 2005/0106376). The Applicants respectfully disagree.

Claim 16 of the present application recites:

16. A method for forming a multilayered dielectric structure comprising:

a) coating a substrate with a first composition comprising a pre-polymer, solvent, optional catalyst, and a porogen to form a film, cross-linking the composition to produce a gelled film, and heating the gelled film at a temperature and for a duration effective to remove substantially all of said porogen to produce a porous dielectric layer which has a porosity of about 10% or more;

b) coating the porous dielectric layer with a second composition comprising a silicon containing pre-polymer, solvent, and optional catalyst; followed by cross-linking and heating to produce an adhesion promoting dielectric layer on the porous dielectric layer which has a porosity of about 10% or less; and

c) forming a substantially nonporous capping layer on the adhesion promoting dielectric layer.

In the current Office Action, the Examiner now concedes that Gallagher does not disclose a substantially nonporous capping layer; however, the Examiner then improperly combines Gallagher with Gnade to get to the result of claim 1. In order to satisfy the obviousness query, the Examiner must show some reason, suggestion, or motivation from the prior art as a whole for the person of ordinary skill to have combined or modified the references. The Patent Office has supported this view by stating: "When the incentive to combine the teachings of the references is not readily apparent, it is the duty of the examiner to

explain why combination of the reference teachings is proper...Absent such reasons or incentives, the teachings of the references are not combinable." (Ex Parte Skinner, 2 USPQ2d 1788, 1790).

Specifically, Gallagher teaches that a metal layer, seed layer or barrier layer must be applied on top of the porous dielectric layer, before any additional layers are applied. Its the essence of the Gallagher invention. Once the metal layer, seed layer or barrier layer is applied, both the porous layer and other layer are treated to remove some of the porogen from the porous dielectric layer. It is only after that point when an additional layer is applied, such as another dielectric layer. These metal layers, barrier layers and seed layers are specifically – by definition – designed to keep an additional layer from migrating into the layer below the metal layer, barrier layer or seed layer. ***In addition, the Gallagher reference specifically teaches against adding a cap layer throughout the reference and specifically in Column 11, lines 37 and 38, when Gallagher states: "Further, the elimination of an added cap layer provides a porous dielectric material layer having a rough surface."*** (emphasis added) Given that the Gallagher reference teaches against adding a cap layer, as mentioned, and that this elimination of the cap layer is the essence of the Gallagher invention, it would definitely be improper to suggest that one of ordinary skill in the art would read that reference and see a motivation to combine it with the Gnade reference. Gallagher wants a porous dielectric material layer having a rough surface and gets this desired surface by not adding a cap layer, so how does Gnade combine with Gallagher? The answer is that it cannot possibly combine logically with Gnade and therefore, the combination by the Examiner is improper.

In claim 16 of the present application, a method is recited wherein a porous dielectric layer is adhered to a cap layer via an intermediate adhesion promoting dielectric layer. It is clear from the specification that the adhesion promoting layer is applied directly to the underlying porous dielectric layer, especially given the statement on page 25, lines 17-20: "Preferably the coating of the adhesion promoting dielectric layer onto the porous dielectric layer results in an infiltration of the adhesion promoting layer into the porous dielectric layer of about 300 angstroms or less." This infiltration of the adhesion promoting layer into the porous

dielectric layer would be virtually impossible if there was a metal layer, barrier layer or seed layer between the two by virtue of the very nature of these types of barrier layers. One of ordinary skill in the art of semiconductor chemistry would not read the Gallagher reference and understand it to mean that the metal layer, barrier layer or seed layer can be removed in order to apply an adhesion promoting layer to a porous dielectric layer.

In addition, claim 16 recites a substantially nonporous cap layer applied to the adhesion promoting layer. The Gallagher reference specifically teaches against using a cap layer, because the Gallagher invention is designed to eliminate the need of a cap layer. One of ordinary skill in the art would not read the Gallagher reference, after specifically stating that one of the goals of the invention is to eliminate the need for a capping layer, and understand it to mean that a substantially non-porous capping layer can be applied to the layered material.

The question then becomes whether the Leung reference cures the deficiencies of the Gallagher reference, so as to teach, suggest or motivate one of ordinary skill in the art to produce the subject matter of claim 16. The Examiner is using the Leung reference to show how Leung is improving nanoporous silica dielectric films. Leung is not being utilized, however, to add to the Gallagher reference in order to render obvious claim 16 of the present application, because Leung doesn't supplement Gallagher's teaching that a metal layer, seed layer or barrier layer must be applied on top of the porous dielectric layer, before any additional layers are applied. Leung also isn't being used to supplement Gallagher's teaching against adding a cap layer to the layered material. Therefore, the combination of the Gallagher reference, the Gnade reference and the Leung reference contributes nothing to the Examiner's point that these three references combined renders unpatentable claim 16 of the present application. In addition, claims 17-23 are also allowable by virtue of their dependency on independent claim 16.

REQUEST FOR ALLOWANCE

Claims 1-23 are pending in this application, and the Applicant respectfully requests that

the Examiner reconsider all of the claims in light of the arguments presented and allow all current and pending claims.

Respectfully submitted,
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